STUDY PROJECT

THE ARMY AND MILITARY IN SPACE

BY

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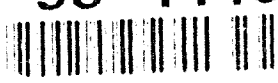
USAWC CLASS OF 1993

U.S. ARMY WAR COLLEGE, CARLISLE BARRACKS, PA 17013-5050



Unclassified

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release. Distribution is unlimited.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION U.S. ARMY WAR COLLEGE 6b. OFFICE SYMBOL (if applicable)	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and ZIP Code) Root Hall, Building 122 Carlisle, PA 17013	7b. ADDRESS (City, State, and ZIP Code)
8a. NAME OF FUNDING/SPONSORING ORGANIZATION 8b. OFFICE SYMBOL (if applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State, and ZIP Code)	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO / PROJECT NO / TASK NO / WORK UNIT ACCESSION NO

11. TITLE (Include Security Classification)
The Army and Military in Space

12. PERSONAL AUTHOR(S)
HEUSER, Gary E., LTC

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Individual	FROM _____ TO _____	1993 April 15	27

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

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20. DISTRIBUTION/AVAILABILITY OF ABSTRACT X UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION
22a. NAME OF RESPONSIBLE INDIVIDUAL WALTER C. INGRAM, COL, SC	22b. TELEPHONE (Include Area Code) 717-245-3032
22c. OFFICE SYMBOL AWCAC	

DD Form 1473, JUN 86 Previous editions are obsolete. SECURITY CLASSIFICATION OF THIS PAGE

USAWC MILITARY STUDIES PROGRAM PAPER

THE ARMY AND MILITARY IN SPACE

AN INDIVIDUAL STUDY PROJECT

by

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ABSTRACT

AUTHOR: Gary E. Heuser, LTC, USA

TITLE: The Army and Military in Space

FORMAT: Individual Study Project

DATE: 15 April 1993 PAGES: 27 CLASSIFICATION: Unclassified

Considering the National and Department of Defense Space Policy, current fiscal constraints, and a revised world environment, an examination is conducted of the Army's present involvement in the space community and how that achieves the national security strategy. The importance of space-related systems supporting the regional warfighting Commanders in Chief, is assessed in relation to the Army's role.

"Since men live upon the land and not upon the sea, great issues between nations at war have always been decided ... either by what your Army can do against your enemy's territory and national life, or else by fear of what the fleet makes is possible for your Army to do."

- Julian S. Corbett
Some Principles of Maritime Strategy

INTRODUCTION

DESERT STORM provided the medium to focus the effects of space operations on military capabilities. Awareness of the added dimension of space to the battlefield was heightened throughout the defense community as well as the public and commercial sectors.

The above quotation takes on a broader context and greater importance as we begin to apply the possibilities that space-based systems extend to our military capabilities. Land Force Dominance, replacing AirLand Battle Doctrine, requires the integration of many systems, space-related systems have become key and critical to the successful application of this concept. Space-based systems provide a force multiplying effect that cannot and must not go unharnessed. "Technical advances in space systems are reaching a point where the outcome of theater conventional conflict may be decided in favor of the side best able to control space or deny its effective use to an adversary."[1]

As in all other dimensions of our world, the communications - information explosion has brought all elements of the world closer together in time and distance. The use and involvement of space in the application of our national policy through military power is a

natural extension of this development. Heretofore the use of space systems has been limited specifically to the national level only. Involvement in the theater of operations became feasible over the past few years with the increase of space-based systems and communications links. With the increased availability of space-based resources, applications utilizing the benefits of these resources, such as the Global Positioning and Navigation System (GPS/NAV), have become possible even for the individual soldier.

Space-based systems now have a capability and application that crosses all levels of conflict simultaneously, eg. strategic, operational, and tactical. As an example, in the case of surveillance activities, what determines the level of information usefulness is what is done with the information. The issue then becomes one of defining the appropriate level of system fielding and the relevant time scale for cost effectiveness and affordability. With the advent of public awareness and growing concern over the deficit, the defense industry is faced with a new administration imposing severe constraints on military spending.

The issue of space support is a complex one, especially when considering the required integration of the national security, civil, and commercial sectors. The current economic situation has focused attention on the defense establishment and its requirements and redundancies.

This paper will briefly review the application of space-based systems to national security measures and the military roles and missions. It will offer an alternative approach to the organizational structure of the USSPACECOM within the Department of Defense.

THE DEVELOPMENT OF SPACE

It must be remembered that even though the United States enjoys a long and rich heritage of efforts in space, this nation did not lead the way into space. After being surprised by the Soviet Union with the launch of Sputnik I in 1957, the United States responded with an effort that has lasted for over 30 years marked by extraordinary achievement throughout the period. The U.S. Army led the way into space with the development of the first anti-ballistic missile system, Nike-Zeus in 1956 and the launch of Explorer I atop a Juptier-C in 1957. The first astronauts were launched by a U.S. Army Mercury-Redstone missile in 1961.[2] With the creation of the National Aeronautics and Space Administration (NASA) in 1958 the lead for developing space transferred officially from the Army. The Army did continue to conduct research though, which resulted in the Safeguard antiballistic missile system in 1975, the nation's only operational strategic defense system. The program was terminated at the direction of Congress because of limits imposed by the Anti-ballistic Missile (ABM) Treaty & the economy.[3]

The efforts of the U.S. Army may be summed up in the words of Colonel Jan V. Harvey, Strategic Studies Institute, Army War College: "Although the Army now heavily depended on space systems for communications, command and control, reconnaissance, and weather information, its role has declined from being the lead service in space operations in the late 1950s to that of the customer of the services provided by space systems."[4]

Today all military services are heavily reliant on and involved in the development of space-based systems to accomplish their mission. Recognizing the need for centralized control of space-related activities, the Air Force organized the Air Force Space Command in 1982, and the Navy followed with its own command shortly after in 1983.[5] A Joint United States Space Command (USSPACECOM) was created in 1985. The Army joined the other services by establishing its own Space Command in 1988.[6] These organizations now serve both as the advocates for space systems within their respective services and as the operators of these systems, when developed and deployed. USSPACECOM exercises operational command of the assigned military space assets through these service component space commands and provides centralized control of space-related activities for the Department of Defense (DoD). USSPACECOM is a unified command within the Unified Command Plan and supports the regional warfighting Commanders in Chief (CINCs). The broad mission responsibilities of USSPACECOM are space operations, surveillance and warning, and ballistic missile defense.[7]

Parallel to the military's development of space-based systems has been the public and commercial ventures. In some respects these developments have also driven military applications. A host of military and civil communications satellites were developed, especially by the commercial community, generating an enormously profitable industry within the United States. This communications and information industry has led and continues to lead the world today. To effectively support and integrate these parallel developments requires a coherent national space policy.

NATIONAL SPACE POLICY

The National Space Policy is contained in a presidential directive, dated 2 November 1989. This policy identifies the United States space interests. These interests are served by three distinct elements of society; civil, national security, and commercial. The policy affirms "the national commitment to the exploration and use of space in support of our national well being."[8] It commits the United States to a policy that recognizes the exploration and use of outer space by all nations for peaceful purposes and for the benefit of all mankind. The policy identifies that the overall goals of U.S. space activities are:

> (1) to strengthen the security of the United States;
> (2) to obtain scientific, technological, and economic benefits for the general population and to improve the quality of life on Earth through space-related activities;
> (3) to encourage continuing United States private-sector investment in space and related activities:
> (4) to promote international cooperative activities taking into account United States national security, foreign policy, scientific, and economic interests;
> (5) to cooperate with other nations in maintaining the freedom of space for all activities that enhance the security and welfare of mankind; and, as a long-range goal,
> (6) to expand human presence and activity beyond Earth orbit into the solar system.[9]

This policy is a broad statement which addresses all of our vital national interests and in principle proposes the pursuit of our nation security objectives through "peaceful purposes". Also

contained in the document are directives, expectations, and a framework for developing civil, commercial, national security, and inter-sector space policy and programs.

From the national space policy one can see that activities which involve the elements of space impact far beyond the realm of national security. From this realization it is apparent that a "center of gravity" for the United States has emerged that impacts across the broad spectrum of conflict, from the strategic to the tactical level; SPACE. The ability to employ the "high ground" is now fundamental to national security. The involvement of space-based systems in support of operations DESERT SHIELD/STORM and PROVIDE COMFORT contributed significantly to the confirmation of this fact.

The Department of Defense Space Policy therefore directly links the National Military Strategy and the National Space Policy to national security endeavors in space. It is against this background strategy of strategic deterrence and defense, forward presence, crisis response, and reconstitution that the DoD Space Policy was formed. The three specific areas in which efforts are to be focused by defense endeavors are:

> (1) deterrence, or if necessary, defense against enemy attack.
> (2) enhancing operations of U.S. and allied forces by employment of space systems.
> (3) assuring that forces of hostile nations cannot prevent our own use of space.[10]

This policy reinforces the ideal that the United States will pursue a course of action in space that supports its inherent right of self-defense and commitment to its allies. The policy clearly

supports the national military strategy through the employment of the space environment and establishes a policy of space control in time of conflict. The need for assured access to space will exist throughout the conflict spectrum and it could become a critical element in medium to high intensity conflicts on tactical battlefields.

The Army Space Policy, as a further amplification of the National Space Policy and Department of Defense Space Policy, calls for the Army to:

** Capitalize on emerging space systems' capabilities.
** Exploit space activities that contribute to the successful execution of Army missions.
** Support assured access to space and use of space capabilities to aid strategic, operational and tactical missions.[11]

Some would believe that our national space policy and doctrine are born of the same inductive process from which our nuclear doctrine and policies were derived. Thus we have embarked on the same process in the development of our national space policy and doctrine. Our nuclear doctrine, by necessity was threat based, but today, with the absence of "The Cold War," our space involvement and activities are driven by dollar costs over national interests. Therefore DoD, and thus the Army, must selectively choose where to put scarce technology base funds.[12] The current development of the environment of space and as a mission is about where the development of airpower was seventy years ago.

MILITARY ROLES AND MISSIONS

The strategy to accomplish these policy initiatives is contained in the National Military Strategy, January 1993. This strategy is derived directly from the presidential directive on space policy and defines the space force functions. "Space forces must be able to accomplish four tasks:

- space control (combat against enemy forces in space and their infrastructure);
- force application (combat against enemy land, sea, air, and missile forces);
- force enhancement (support for land, sea, and air forces); and
- space support (satellite control and launch capability)."[13]

It might be noted that there is a very strong similarity between the space force functions and the functions the Air Force has defined for itself.[14] This reflects the strong influence the Air Force has had over the evolving space doctrine. It could also be postulated and argued that the development of military space parallels the early development of airpower.

The space functions translate directly into military space operations as defined in the final draft of Joint Pub 3-14, Joint Doctrine; Tactics, Techniques, and Procedures (TTP) for Space Operations, 15 April 1992. The applicable military space operations are Space Combat Support, Space Fire Support, Counterspace Operations, and Space Operations Mission Support. The specific building block capabilities of space forces which synthesize the space function into military operational

requirements are shown below as they relate to the space force functions:

Space Force Function	Capability[15]
Space control	Counterspace Operations - Protection - Negation - Surveillance of Space
Force Application	Ballistic Missile Defense Aerospace Defense Power Projection
Force Enhancement	Bathymetry Communications Environmental Monitoring & Meteorology Mapping, Charting, & Geodesy Navigation & Positioning Reconnaissance, Intelligence, Surveillance, & Targeting Warning Processing & Dissemination
Space Support	Launch Operations Satellite Control Space Tracking Logistics Training

None of these capabilities is specifically limited by its nature to a particular service. There is a tendency to assume that if a capability relates to something above the surface it ought to be part of the Air Force. This assumption is quite natural but also erroneous. Some capabilities have been designated to a specific service because of the historical development, technological base, and the resource investment of that particular service component. As the opening quotation highlighted, the nation's vital interests are served by the focus of all elements of

military power to that decision point on the ground. Thus it is "the employment of space capabilities by land, sea, air, space, and special operations forces to gain and maintain a combat advantage throughout the operational continuum and across the three levels of war: strategic, operational, and tactical" that is important.[16]

It should be noted that the list of capabilities has expanded and been refined significantly from those capabilities identified just a few years ago. Technological advances and creative applications continue to improve available capabilities. It can be readily assumed that the list is not yet complete. Continued development and investigation of technological feasible options for military applications must continue to support military space operations.

It is the mission of CINC, USSPACECOM to support other unified and specified commands and their service components. This is accomplished through the service components of USSPACECOM and their application of the capabilities outlined above. The focus of space operations is the warfighter.

CINC's USE OF SPACE

The expanse of the theaters of war, theaters of operations and National Command Authority interest, dictates careful consideration and integration of the space dimension into any campaign by a CINC and his staff. To insure this occurs, USARSPACE has established three subordinate organizations for theater support to properly integrate and optimize all the capabilities of the space dimension. The missions and capabilities impact across a broad spectrum of operational functions, and only by placing responsibility for coordination and management under one element on his staff will he be assured of optimization.

Space Control: The space control mission is primarily a concern of the CINC, USSPACECOM. Capabilities in this area contribute chiefly to his supporting role through counterspace operations. This includes satellite protection and the denial of enemy surveillance of space systems. In this realm, a regional warfighting CINC may have a role to support USSPACECOM operations by attacking those systems that pose a threat to satellite and space systems.

Force Application: The force application mission is a combat function of military space operations. Force application has the objective of defending or projecting power to the benefit of U.S. and allies interests. Currently this function is achieved primarily through an Anti-Ballistic Missile (ABM) Defense System. This system includes ballistic missile launch detection, tracking, and intercept capability that allows for early warning and threat

assessment, and planning and defensive operations. The U.S. Army is a leader in the development of an ABM system for DoD by virtue of its past air defense involvement in research, development, and acquisitions efforts. The results of this effort were demonstrated by the highly successful Patriot system employed in DESERT SHIELD/STORM. Another space force application, useful to a CINC could be an electronic warfare (EW) offensive capability from space directed in depth in the theater. This capability is not specifically addressed in literature presently.

Force Enhancement: Space force enhancement crosses all levels of conflict simultaneously; for example, surveillance activities can be strategic, operational, and tactical at the same time. This element of space operations is the most useful to the regional CINC and ultimately, his Army component. The high ground of space affords the greatest advantages to all CINCs in the force enhancement capabilities available.

Communications inter- and intra- theater via satellite linkage, significantly enhances command, control, communications, and intelligence (C^3I). Communications satellites (COMSATs) have become a requirement for any theater of operation today. Communications satellites provide secure, reliable command and control of U.S. forces anywhere on the globe. Utilization of both military satellite communications (MILSATCOMs) and commercial satellites provides flexibility, reliability, and redundancy. During DESERT SHIELD/STORM nearly half of all communications were routed over the commercial system.[17]

Satellite surveillance provides all CINCs large amounts of

intelligence, reconnaissance, and targeting information. The use of multi-spectral capabilities allows the products of these systems to be used for a wide range of applications by multiple users, to include the CINCs and all service components. Added capabilities of phased-array radar sensing and precision laser designation, are capabilities the CINCs could use as well. When active and passive surveillance techniques are combined, both systems' capabilities are enhanced. These systems give the CINCs a broad attack warning capability, sensitive to more than the strategic threat, and can relieve pressure on his limited joint surveillance target attack radar systems (JSTARS) and airborne warning and control systems (AWACS).

Additionally, the capability to digitize the battlefield or portions of the battlefield can now be realized using either an active or passive means. A positive identification means through transponder employment (an active means), similar to that used at the National Training Center (NTC), provides greater confidence and assurance during actions, that the right targets are being engaged. The surveillance capability also provides imagery that affords the geodetic survey and maps not otherwise available. Included also during surveillance of the theater, are the environment and meteorological conditions. Both the weather and environmental conditions have the potential to influence all operations throughout the theater. A particular surveillance capability that may have special impact on maritime operations is bathymetry.

The Global Positioning System (GPS), will again in the future

prove invaluable as it did in DESERT STORM. The Army became the primary user of this system. Positive location of all forces, known both to the individual soldier and all levels of command, provides definitive assurance in command and control of these forces. All aspects of warfighting, from targeting to logistics benefit from the capability. When integrated with the satellite surveillance systems, targeting and navigation are significantly enhanced.

Space Support: Space support involves keeping the satellite fleet and space systems operating and is a function that does not normally involve a regional warfighting CINC. This includes launch operations, orbital transfer, space tracking, logistics, and training. As with the space control mission, tactical or operational support may be requested from the supported CINC if the need arises.

A CINC will not be able to fight his campaign if he is denied the use of space and space-based systems. Space is, and will continue to be, a center of gravity for the employment of U.S. military force around the world. CINC, USSPACECOM must provide the support and regional CINCs must access and properly employ the assets provided to be successful in any future campaign.

ARMY'S ROLE IN SPACE

Army soldiers are the primary users and benefactors of space-based system. The Army of the future will use space capabilities to improve the execution of its mission in the global environment, beyond the limits of current organic assets. Space-based systems have and will continue to supplement, enhance, and in some instances, replace existing and programmed systems. Space is an integral component of the Army's technological evolution. The advantages of space must not be ignored and must be considered in all operational plans and programmatic decisions.[18]

The Army responsibilities to support space operations are found in JCS Pub 0-2, Unified Action Armed Forces (UNAAF). These responsibilities are essentially the same as those of the other services. They are:

> a. Organizing, training, equipping, and providing Army forces to support space operations.
> b. Developing in coordination with the other Military Services, tactics, techniques, and equipment employed by Army forces for use in space operations.
> c. Conducting individual and unit training of Army space operations forces.
> d. Participating with other Services in joint space operations, training, and exercises as mutually agreed to by the Services concerned or as directed by competent authority.
> e. Providing forces for space support operations for the Department of Defense when directed.[19]

The Army's primary agent for exercising it's space mission is the Army Space Command (ARSPACE). As part of the USSPACECOM, it has the responsibility of presenting the Army's "perspective in planning for DoD space systems support of land forces and strategic

defense operations. The command also integrates Army requirements into space systems operational planning, responds to USCINCSPACE directed tasking, commands assigned forces, and conducts planning for DoD space operations in support of Army strategic, operational, and tactical missions. The command assures access to and use of space capabilities to enhance accomplishment of AirLand Operations doctrine."[20] It also manages field demonstrations of space-related systems.

The Army's Long-Range Plan for Space establishes objectives that implement the Army space policy and institutionalizes the exploitation of space.[21] The plan's basic tenets are

> intended to guide the Army's long-range planning efforts and near- and mid-term actions regarding space activities and are subject to periodic review and revision. The tenets are:
>
> A. Space is integral to AirLand Operations.
> B. Space-related technologies will improve Army capabilities.
> C. Space support to Army forces will increase.
> D. The Army will be assigned more space-related missions.
> E. The Army will continue to exploit non-Army space capabilities.[22]

"The Army is primarily a user of space assets, and becomes directly involved with technology development by exception. When Army requirements drive direct investment in space assets, this investment must build on the substantial government and commercial investment in space technologies that is currently underway within other agencies. The primary emphasis on developing space-related technologies has, in recent history, been a function of the U.S. Air Force, U.S. Navy, the Defense Advanced Research Projects Agency

(DARPA), and the Strategic Defense Initiative Organization (SDIO) for DoD, and NASA for civil applications."[23] The Army must take an active role in determining the direction in which the development of space will proceed. Otherwise it will get what someone else wants or thinks it needs, or even worse, what is left over. This plan supports the development of the capabilities to meet the space functions required to meet the military space operations requirements. The plan does however, identify some significant shortcomings that have plagued the Army for quite some time.

1) "Numerous studies have acknowledged the need for a more effective and efficient organization for Army space activities. The Army must focus on achieving an organization for space best suited to increasing its role in research, development and acquisition (RD&A), and operations to fully exploit the operational capabilities of space systems."[24]

2) Additionally, the Army requires a central organization that has the responsibility and <u>authority</u> to focus all Army activities and achieve coordination of all space-related research, development and acquisition.

3) Organizationally the Army lacks the investment in its tables of organization and equipment (TO&E) and tables of distribution and allowances (TDA) force structure to support a growing space involvement.

4) "ARSPACE will be the operational command responsible for all Army space operations. ARSPACE will be responsible for all space-specific operations and must be prepared to increase its operational role in support of Army operations." Currently the total force of ARSPACE has only 461 authorized positions.

5) The Army requires high quality, dedicated and innovative personnel with wide-ranging space expertise. It currently lacks a fully structured career program to provide the requisite level of expertise for command, staff, and operational positions.[25]

A substantial step forward in alleviating many of these problems was accomplished when the Army reorganized ARSPACE and made the commander a three star position in July of 1992. Much effort is still required throughout the rest of the Army community to fix the problems noted. It is interesting that these deficiencies were identified by an agency of the Army other than ARSPACE. The Army's long-range plan for space further identifies in excess of ten different agencies within the Army, with which an agency must coordinate to influence project development. To fully realize the benefits that space-based and related systems have to offer, the Army must make the investment and provide structural support throughout the force.

In a declining force structure, resources must be spent where they will get the most out of force multiplying effects. Technology saves lives. Space technology provides dynamic force multiplying effects but requires a significantly long lead time to develop. The resulting surge of space operations during DESERT STORM was primarily due to the short term fix of technology insertion. A full acquisition cycle that other systems have enjoyed in the force integration process, takes a significant period of time. The United States and U.S. Army can ill afford to be surprised in the future as it was when the USSR launched Sputnik I.

Reflecting on the opening quotation, it is true that conflict is ultimately decided between soldiers on land. Consequently the multiplying effects of space must be clearly considered in today's economically constrained force. The results may mean that the outcome of any future conflict might be decided in space or the lack of it. To that end a review of the current Army Modernization Program reveals very little investment for the future, although the intent is there. Recent budget cuts apportioned to the Army have been primarily absorbed by the Army's RD&A community in the hopes that the technology can be bought back in the future.

From a USSPACECOM and other service component perspective this action undermines all services. Cutting system developments by the Army that contribute to or serve as the basis for other service developments, gives rises to a lack of faith in the Army's commitment to space operations. This condition can exist between any service element and when funding for a program is unilaterally reduced by one service, it contributes to the lack of faith in that service and may lead to the development of parochialism in regard to space systems development.

None of the services will operate independent of the other services in the future, as joint and combined operations dominate the nations efforts to achieve its goals. "Congress has not assigned the role of space warfare to any single Service since space crosses all warfare areas and all Services. Yet the foundation for military space operations is well-founded. The role of space warfare is explicitly recognized in both the National Space Policy and National Military Strategy."[26]

As U.S. military forces continue force reductions and restructuring in response to a new strategic and economic environment, space systems are increasingly more important. The capabilities provided by space systems serve as the first forces on-scene, as the principal provider of real-time worldwide support to the national command authority and the fighting forces. These capabilities will continue to be an integral and essential part of DoD operations worldwide.[27]

In a bipolar world it was possible to focus scarce resources. With the emergence of many aspiring states, the focus must broaden and requires significantly more space-based resources, although there can and must be a drawdown elsewhere in the defense structure.

ALTERNATIVES

In his recent review of roles and missions mandated by the Goldwaters-Nichols Act of 1986 and in an effort to further draw down the military and create efficiencies, the Chairman of the Joint Chiefs of Staff has proposed that USSPACECOM become an Air Force Command and possibly unified with the STRATCOM.[28]

This approach seems quite natural to many, but it does have some drawbacks. Space is uniquely suited to be a fully Unified Command. As previously identified, operations in the realm of space cross all levels of conflict, involve all services, while integrating all elements of the nation, to include political, civil, and commercial. Giving the mission to a single service risks separatism and the adoption of a parochial approach leaving other necessary service requirements unfulfilled.[29] Unless funds are fenced, high budget visibility for space programs is lost. When funding space through the Air Force, visibility is lost and it must compete with other Air Force programs. Likewise other service component programs of interest also have to compete within the Air Force budget process. Interest in space programs at the exclusion of Air Force programs or visa-versa, in a resource constrained environment is an unavoidable danger.

The combination of USSPACECOM and STRATCOM carries the political liability of strategic nuclear forces. Treaty considerations and the stated pursuit of national security objectives through peaceful purposes may cause future problems for a combined organization.

There is much discussion, even within the Air Force, over where the boundary of the Air Force ends and space begins.[30] Space is not only a mission but it is an environment as well. The function of the Air Force does not necessarily translate directly to mean a space mission. The long standing argument between the Army and Air Force over who should have the role of air defense highlights the complexity of defining boundaries when missions and environment can overlap. For this reason, it is just as difficult to say that the Air Force alone should have responsibility for space. In space the environmental boundary is fixed by the laws of physics.

Joint Pub 3-14 recognizes the regime of space is sufficiently different from all others.[31] By defining, for the future, the three regions of space, it indicates a movement of thought toward the recognition of a separate service. The Air Force has been, and will continue to be, heavily involved in space activities just as all the services. A separate service is not the answer to the development of space as a military medium over the next two decades, although the mission and environment are sufficiently different to warrant consideration. Political and fiscal constraints make this option most impractical at this time.

Three problems that led the 1986 Goldwater-Nichols Act to establish the United States Special Operations Command (USSOCOM) have been present in the evolving space operations. The same problems have been recognized at least within the Army (addressed in the Army's Long-Range Plan for Space);

> - the ad hoc nature of the organization,
> - unclear command relationships,
> - lack of dedicated forces - specifically trained as a joint team.[32]

USSPACECOM organized similar in nature to the United States Special Operations Command merits consideration. Currently, it is already a unified command, although dominated by the Air Force. The key element that makes USSOCOM unique is that it manages its own budget and has acquisiton authority. Action similar in nature with regard to USSPACECOM does several things.

First, this action solidifies the national commitment to space by removing space-based activities as a pawn to be brokered among and within service components. The desired efficiencies, consolidation of efforts, and reduction of redundancies can be accomplished by the CINC, USSPACECOM. This action also meets with current trends toward joint activities. Clear budgetary visibility of efforts to accomplish the military space operations objectives results, rather than having funds for space programs hidden within Army, Navy, and Air Force budgets where visibility is lost and sometimes obscured. This relieves the requirement to fence monies within service budgets for programs specifically dedicated to space efforts. And lastly, it allows for the accomplishment of the national space policy and national military strategy, while simultaneously meeting fiscal constraints.

CONCLUSION

> ". . . great issues between nations at war have always been decided ... either by what your Army can do against your enemy's territory and national life, or else" now by fear of what your command of space "makes is possible for your Army to do."

DESERT STORM proved that U.S. military forces are, without question, tied to space and that space cannot be separated from our national security. There are many challenges, but space operations have become as critical to military operations as air or sea power were in the past. In today's unstable world, economically and politically constrained efforts must be intensely focused, so that the nation might attain it's national security goals through our national space policy objectives with the greatest of efficiency. No service can afford to operate independently and must operate in concert as a functionary of the United States Space Command as the nation seeks to achieve its civil, military and commercial goals in space and around the globe.

ENDNOTES

[1]Christopher D. Lay, "Space Control Predominates as Multipolar Access Grows." SIGNAL Magazine, The Armed Forces Communications and Electronics Association, 1990, reprinted in Implementing National Military Strategy, (Vol II). U.S. Army War College. Carlisle Barracks: 1991, 580.

[2]LTC Pat Gagan, USA, "The Army Space Command." Military Review LXVII, no. 3 (March 1988): 45.

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